

to understand, the above capacitor structures will be further described below with reference to FIG. 1.

[0043] Because some defects exist in the electrostatic protection of the touch product at present, and the ESD problem occurs in a bridge-point area in most cases, in the following, a structure of the OGS touch panel is taken as an example. An electrostatic protection unit (ESD unit) for discharging electricity in the structure has a plurality of multilayer structures (i.e., the capacitor structures), and mainly consists of transmission lines (i.e., the above signal transmission lines), the ground wire, and the insulation medium layer therebetween. One end of each transmission line is connected to a transparent electrode (i.e., the touch electrode), and the other end is connected to an internal wiring Pad. The ground wire is arranged at a different layer from the transmission lines. This structure makes the transmission lines and the ground wire form a plurality of capacitors that can store static electricity from the transparent electrode.

[0044] FIG. 1 is a structural schematic view showing a touch panel according to an embodiment of the present disclosure. As shown in FIG. 1, descriptions for the structure are as follows:

[0045] 1. The touch panel has transparent electrodes **101** arranged in rows and transparent electrodes **102** arranged in columns. The material of the transparent electrodes may be indium tin oxide (ITO) or aluminum-doped zinc oxide (AZO) or graphene. The transparent electrodes **102** arranged in columns are connected to each other by via holes in the insulation layers and bridge structures **201**.

[0046] 2. The transparent electrodes **101** and the internal wiring Pads are connected with transmission lines **401**. The material of the transmission lines may be the transparent conducting material (such as ITO, AZO) or the metal material (such as Mo/Al/Mo, Cu). The line width of each signal transmission line may be set in a range of 2.5 mm-4.5 mm. For example, in an actual process, the line width of each signal transmission line may be set to about half of a pixel interval of the touch panel.

[0047] A GND wire **301** (i.e., the ground wire) may be arranged on a layer above or under the transmission lines **401**. The GND wire **301**, the transmission lines and the insulation layer located therebetween together form multilayer structures (i.e., the capacitor structures). The insulation layer may be an overcoat (OC) material or other insulating material. Since there are multiple capacitor structures, when stronger static electricity exists, a plurality of multilayer structures, which function as ESD, can timely discharge the static electricity to the ground wire.

[0048] The embodiment of the present disclosure also provides a display device. The display device includes the touch panel mentioned above. The display device may be any product or part with a displaying function, such as a display panel, a television, a display, a digital photo frame, a phone, a tablet computer, etc.

[0049] The embodiment of the present disclosure also provides a method for manufacturing a touch panel. FIG. 2 is a schematic view of a method for manufacturing a touch panel according to an embodiment of the present disclosure. As shown in FIG. 2, the flow includes the following step:

[0050] In step S202, forming, signal transmission lines that are connected with touch electrodes on the touch panel, and a ground wire that is arranged at a different layer from and insulated from the signal transmission lines, a projection

of the ground wire onto a plane in which the signal transmission lines are located intersecting the signal transmission lines, wherein a plurality of capacitor structures for storing static electricity is formed by the signal transmission lines and the ground wire at intersections.

[0051] In the embodiment of the present disclosure, during a process of forming the signal transmission lines and the ground wire, an insulation medium layer may also be formed between the signal transmission lines and the ground wire.

[0052] That is to say, during a process of forming the entire touch panel, to form the capacitor structures for storing static electricity, different processes may be adopted according to a position relationship between the signal transmission lines and the ground wire. For example, the ground wire may be formed first, and then the insulation medium layer is formed, and finally the signal transmission lines are formed. Since the touch electrodes and the signal transmission lines are connected, the touch electrode may be formed in a same layer as the signal transmission lines. In another embodiment, the touch electrodes and the signal transmission lines may be formed in a same layer, and then the insulation medium layer is formed, and finally the ground wire is formed. In short, no matter what kind of process is adopted, the above capacitor structures for storing static electricity may be formed as long as the ground wire is arranged at a different layer from and insulated from the signal transmission lines.

[0053] By the structure of the touch panel provided by the embodiment of the present disclosure, when a high voltage and a large current are generated in the touch panel, the multilayer structures can bear the high voltage and the large current, and discharge the static electricity generated by the touch electrodes to the ground in time, so as to protect an inner pixel, improve ESD protective performance of the touch panel product, and improve the process yield of the touch panel product.

[0054] The above are merely the preferred embodiments of the present disclosure and shall not be used to limit the scope of the present disclosure. It should be noted that, a person skilled in the art may make improvements and modifications without departing from the principle of the present disclosure, and these improvements and modifications shall also fall within the scope of the present disclosure.

1. A touch panel, comprising:

touch electrodes;

signal transmission lines, connected with the touch electrodes; and

a ground wire, arranged at a different layer from and insulated from the signal transmission lines, a projection of the ground wire onto a plane in which the signal transmission lines are located intersecting the signal transmission lines;

wherein a plurality of capacitor structures for storing static electricity is formed by the signal transmission lines and the ground wire at intersections.

2. The touch panel according to claim 1, further comprising:

an insulation medium layer between the signal transmission lines and the ground wire.

3. The touch panel according to claim 2, wherein a line width of each signal transmission line is greater than a preset width threshold which is 0.5 mm.